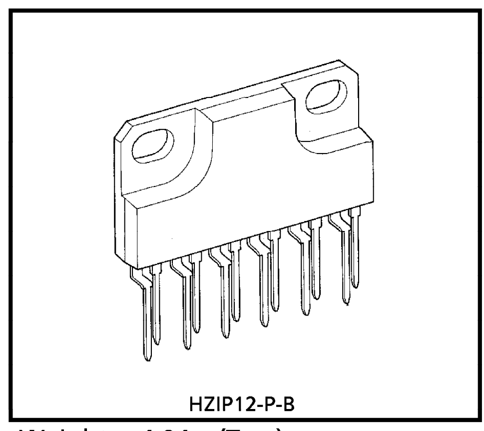
DUAL AUDIO POWER AMPLIFIER

The TA8200AH is dual audio power amplifier for consumer applications.
This IC provides an output power of 13 watts per channel (at $V_{CC}=28V$, $f=1kHz$, $THD=10\%$, $R_L=8\Omega$).
It is suitable for power amplifier of TV and home stereo.

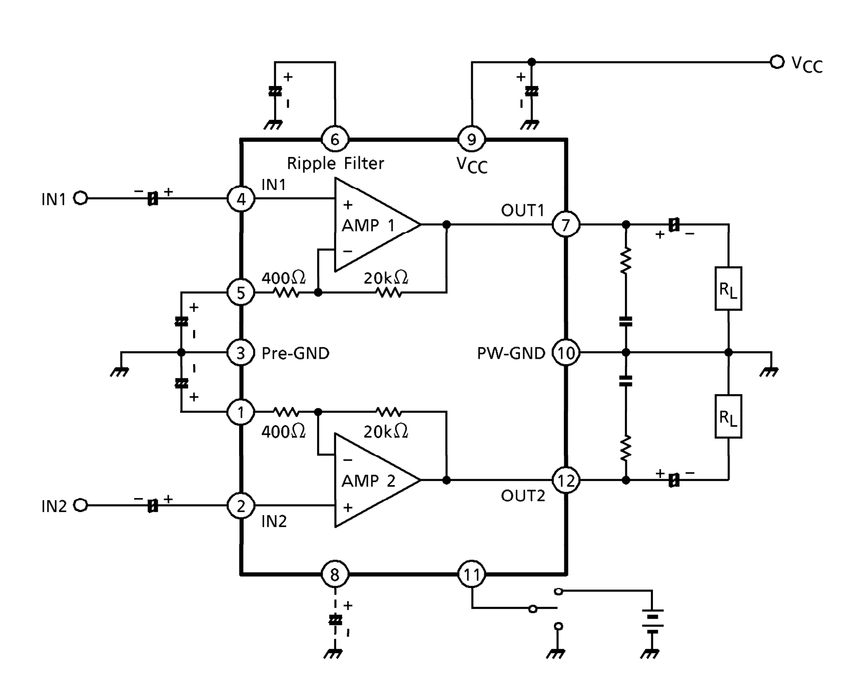


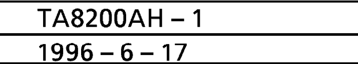
Weight : 4.04g (Typ.)

FEATURES

- High Output Power : $P_{out}=13W$/channel (Typ.)
  ($V_{CC}=28V$, $R_L=8\Omega$, $f=1kHz$, $THD=10\%$)
- Low Noise : $V_{no}=0.14mV_{rms}$ (Typ.)
  ($V_{CC}=28V$, $R_L=8\Omega$, $G_V=34dB$, $R_g=10k\Omega$, $BW=20Hz\sim20kHz$)
- Very Few External Parts.
- Built in Audio Muting Circuit.
- Built in Thermal Shut Down Protector Circuit.
- Operating Supply Voltage Range : $V_{CC\,(opr)}=10\sim37V$ ($Ta=25°C$)

BLOCK DIAGRAM





APPLICATION INFORMATION

(1) Voltage gain

The closed loop voltage gain is determined by R_1, R_2.

$$G_V = 20\ell og \frac{R_1 + R_2}{R_2} \text{ (dB)}$$

$$= 20\ell og \frac{20k\Omega + 400\Omega}{400\Omega} = 34 \text{ (dB)}$$

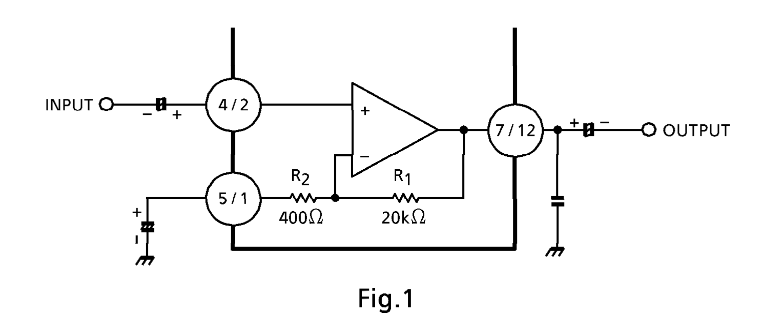


Fig.1

(2) Amplifier with gain < 34dB

$$G_V = 20\ell og \frac{R_1 + R_2 + R_3}{R_2 + R_3} \text{ (dB)}$$

When $R_3 = 220\Omega$
$G_V \fallingdotseq 30$ (dB)
is given.

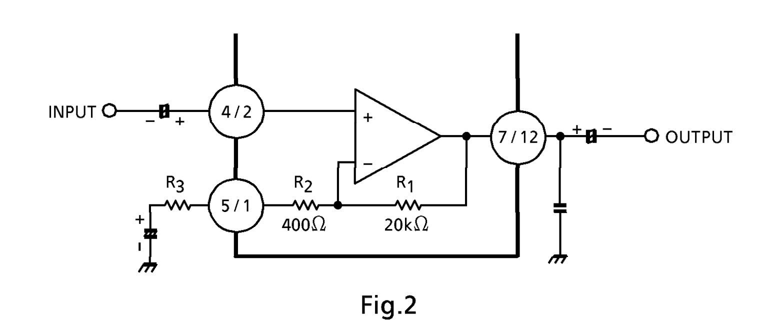


Fig.2

2. Muting

(1) Audio muting

This IC is possible to make audio muting operation by using ⑪pin muting terminal.
In Fig.3, the equivalent circuit in the muting circuit section is shown.
By means of reducing the voltage of ⑪pin down to 2.8V or less in Fig.3, Q_1 is turned ON and the base voltage of Q_2 in the differential circuit fabricated with Q_2 and Q_3.
Therefore, with the voltage reduction of ⑪pin, the input circuits of dummy of input terminal and that in the doted line operate and cut-off the input signal.
After muting, the bias circuit continues ist operation and the power supply current of quiescent time.
⑧pin, the capacitor terminal for reducing the pop noise can reduce the pop noise through making the time constant longer by means of inserting the capacitor externary.
In the care this terminal is not used, short ⑧pin with ⑪pin.
The voltage of ⑪pin set up to 4V or more.

(2) IC internal muting at V_{CC} OFF

When V_{CC} = 8V or less at V_{CC} off, the detection circuit at V_{CC} off is operated. And the base voltage of Q_1 is reduced and the muting operation is mode.

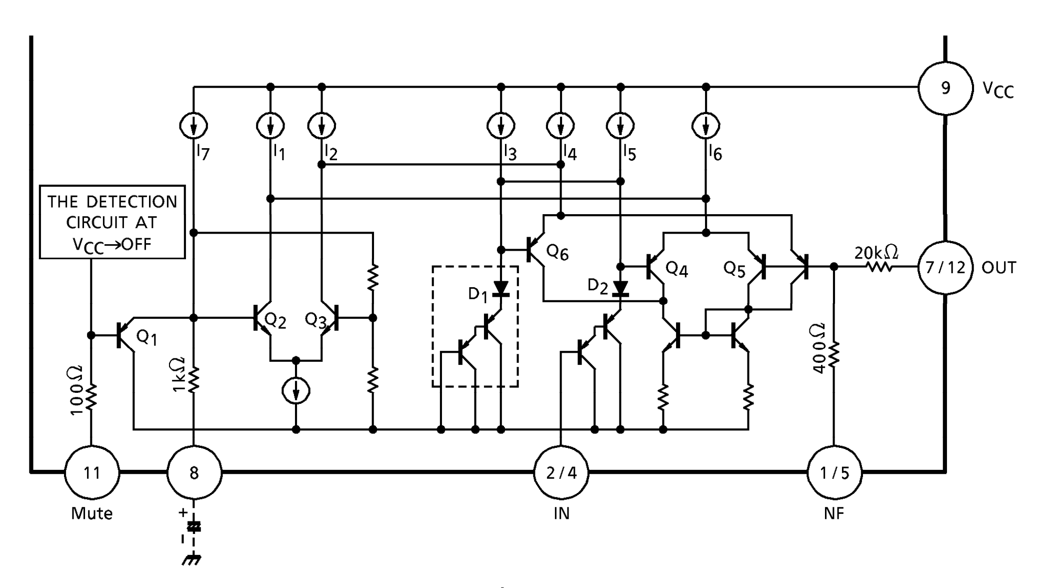
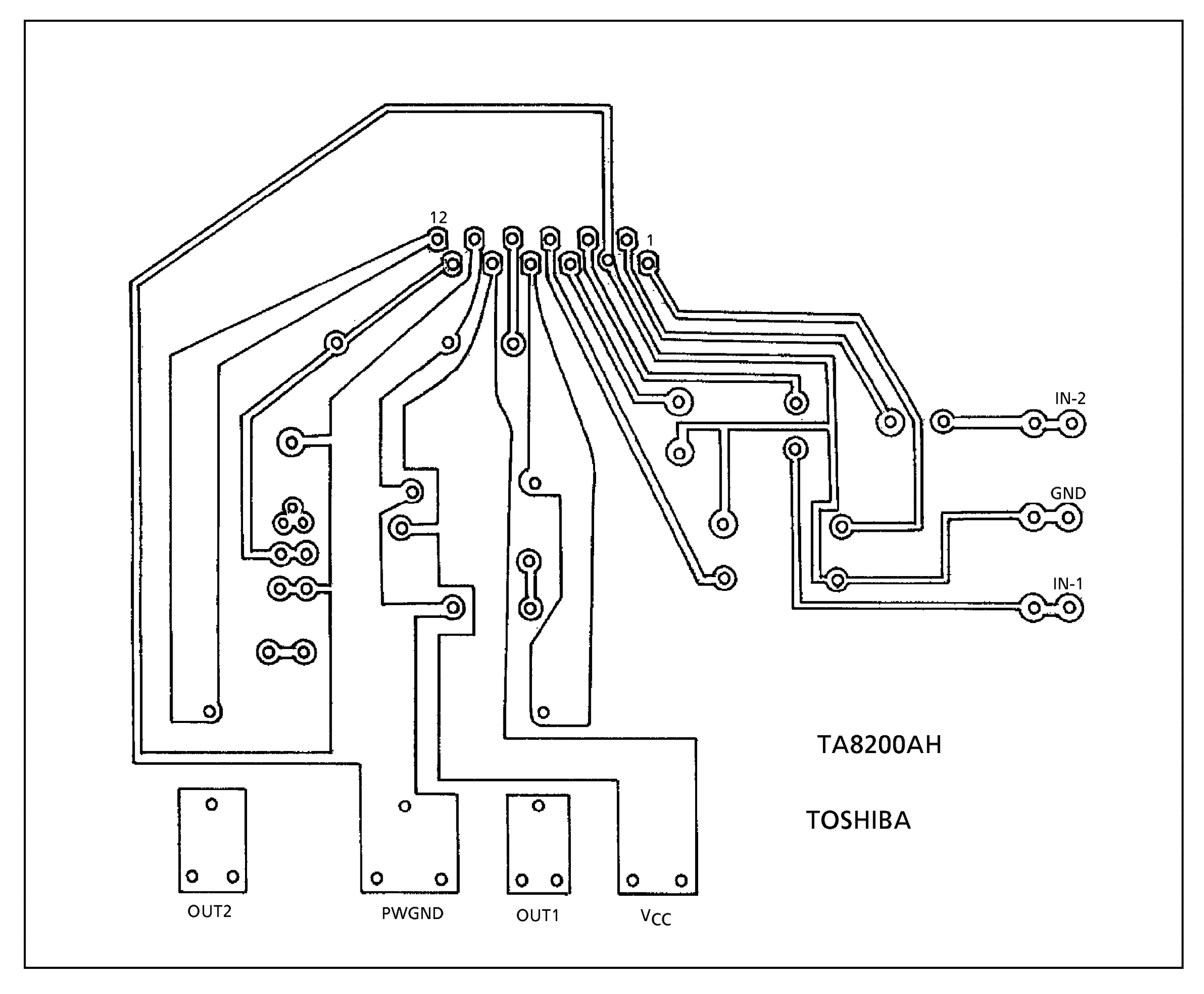


Fig.3

(3) Standard PCB TA8200AH



(BOTTOM VIEW)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	37	V
Output Current (Peak / Ch)	$I_{O\,(peak)}$	2.5	A
Power Dissipation	P_D (Note)	25	W
Operating Temperature	T_{opr}	−20~75	°C
Storage Temperature	$T_{stg.}$	−55~150	°C

(Note) Derated above Ta = 25°C in the proportion of 200mW / °C.

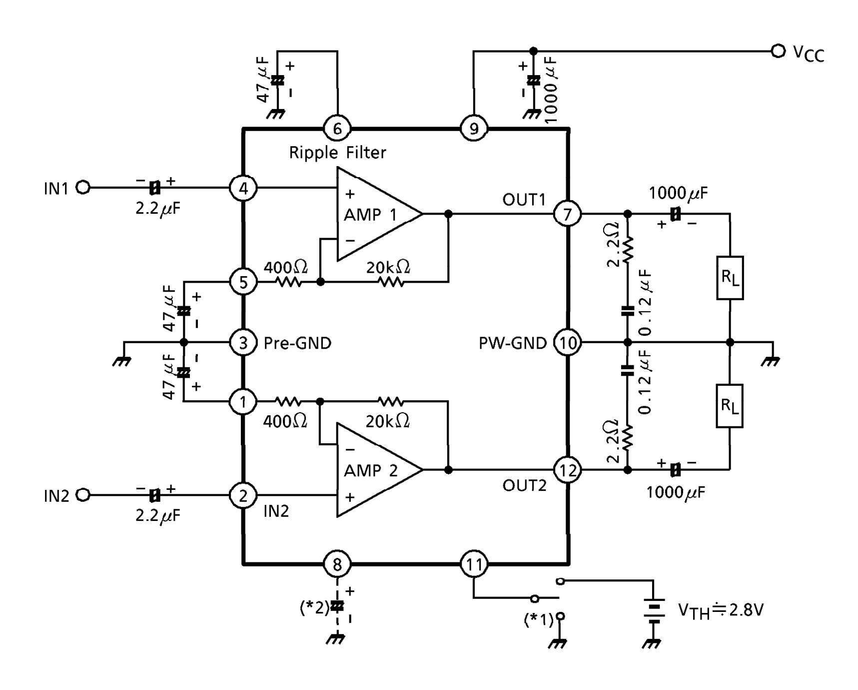
ELECTRICAL CHARACTERISTICS
(Unless otherwise specified, V_{CC} = 28V, R_L = 8Ω, R_g = 600Ω, f = 1kHz, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	—	V_{in} = 0	—	50	105	mA
Output Power	$P_{out\,(1)}$	—	THD = 10%	10	13	—	W
	$P_{out\,(2)}$	—	THD = 1%	—	10	—	
Total Harmonic Distortion	THD	—	P_{out} = 2W	—	0.04	0.2	%
Voltage Gain	G_V	—	V_{out} = 0.775V_{rms} (0dBm)	32.5	34.0	35.5	dB
Input Resistance	R_{IN}	—	—	—	30	—	kΩ
Ripple Rejection Ratio	R.R.	—	R_g = 0, f_{ripple} = 100Hz V_{ripple} = 0.775V_{rms} (0dBm)	−40	−50	—	dB
Output Noise Voltage	V_{no}	—	R_g = 10kΩ, BW = 20Hz~20kHz	—	0.14	0.3	mV_{rms}
Cross Talk	C.T.	—	R_g = 10kΩ, V_{out} = 0.775V_{rms} (0dBm)	—	−70	—	dB
Muting Threshold Voltage	V_{th}⑪	—	—	2.6	2.8	—	V

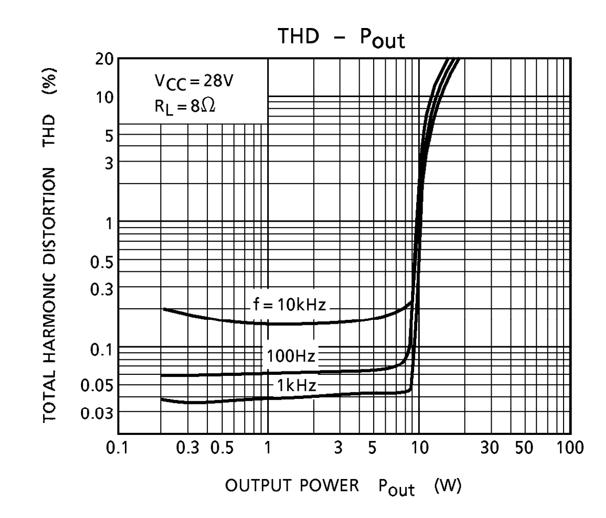
TYP. DC VOLTAGE OF EACH TERMINAL (V_{CC} = 28V, Ta = 25°C)

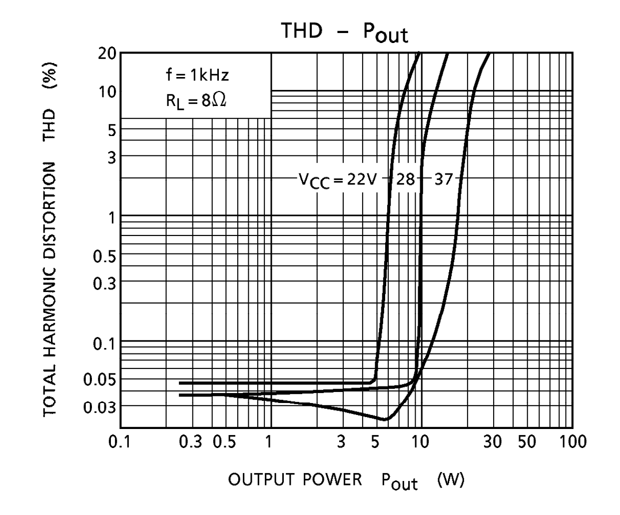
TERMINAL No.	1	2	3	4	5	6	7	8	9	10	11	12
DC Voltage (V)	1.6	20m	GND	20m	1.6	9.4	13.0	5.0	V_{CC}	GND	2.8	13.0

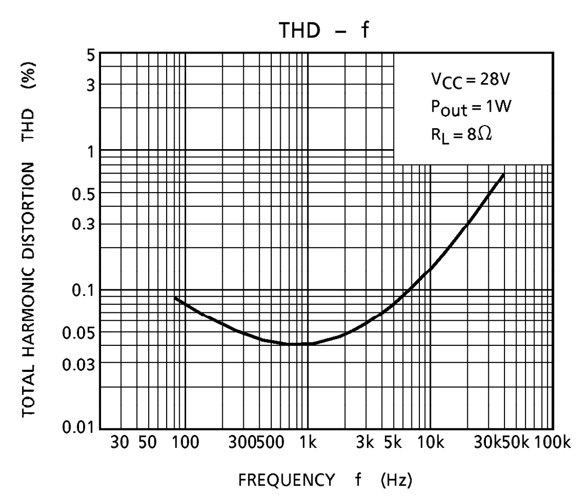
TEST CIRCUIT

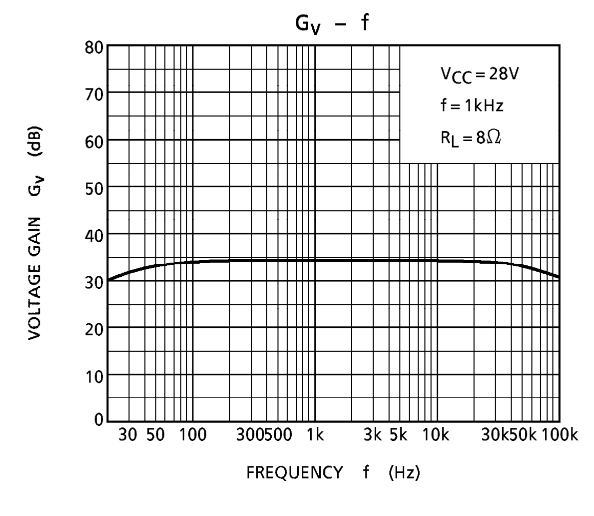


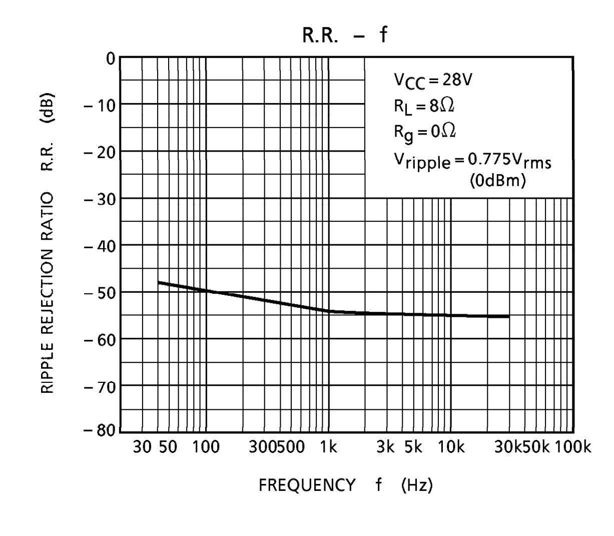
(*1) Mute on at ⑪pin low
V_{TH} = 2.8V (Typ.), V_{CC} = 28V, Ta = 25°C
(*2) The capacitor for reducing POP noise at mute ON.

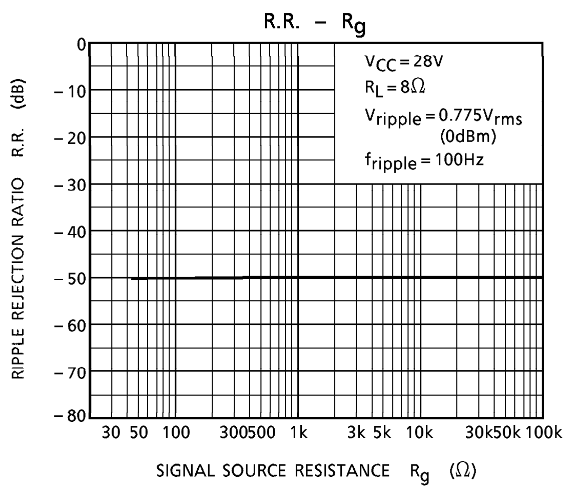

THD – P_{out}
V_{CC} = 28V
R_L = 8Ω
f = 10kHz
100Hz
1kHz
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT POWER P_{out} (W)

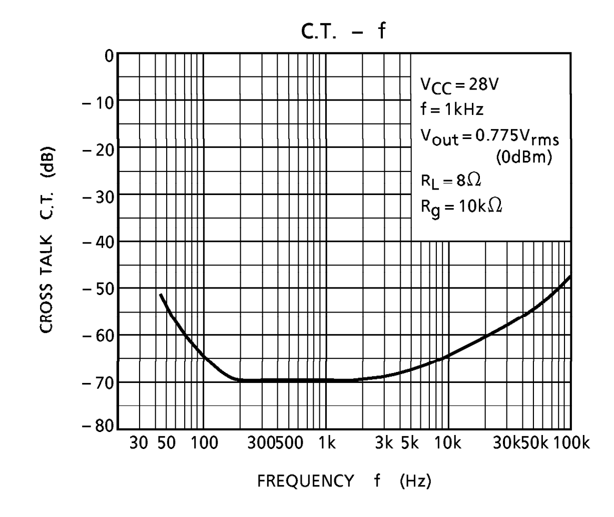

THD – P_{out}
f = 1kHz
R_L = 8Ω
V_{CC} = 22V
28
37
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT POWER P_{out} (W)

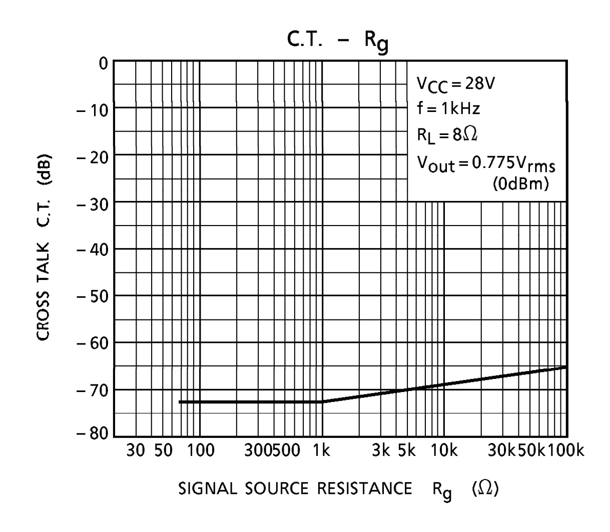

THD – f
V_{CC} = 28V
P_{out} = 1W
R_L = 8Ω
TOTAL HARMONIC DISTORTION THD (%)
FREQUENCY f (Hz)

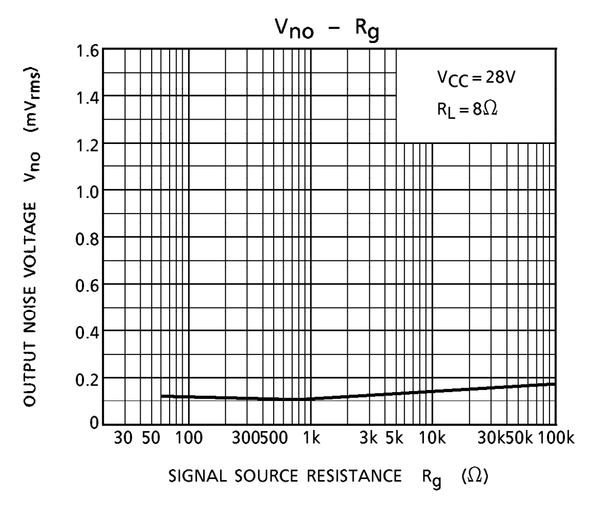

G_V – f
V_{CC} = 28V
f = 1kHz
R_L = 8Ω
VOLTAGE GAIN G_V (dB)
FREQUENCY f (Hz)

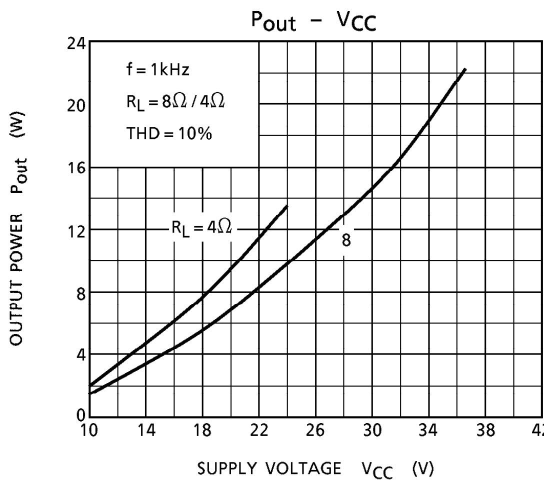

R.R. – f
V_{CC} = 28V
R_L = 8Ω
R_g = 0Ω
V_{ripple} = 0.775V_{rms}
(0dBm)
RIPPLE REJECTION RATIO R.R. (dB)
FREQUENCY f (Hz)

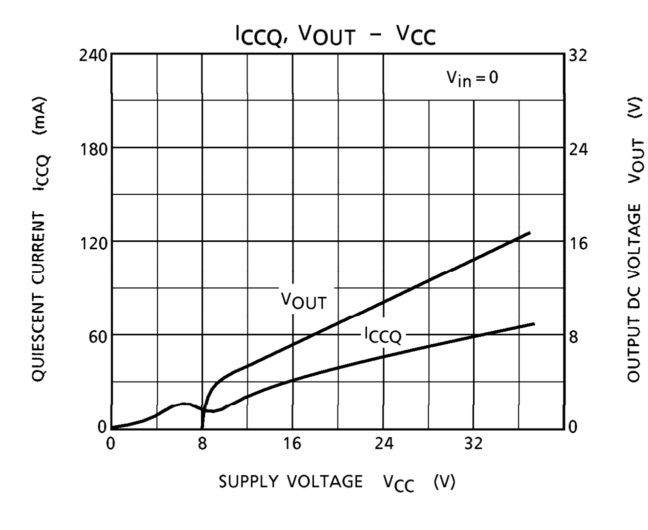

R.R. – R_g
V_{CC} = 28V
R_L = 8Ω
V_{ripple} = 0.775V_{rms}
(0dBm)
f_{ripple} = 100Hz
RIPPLE REJECTION RATIO R.R. (dB)
SIGNAL SOURCE RESISTANCE R_g (Ω)

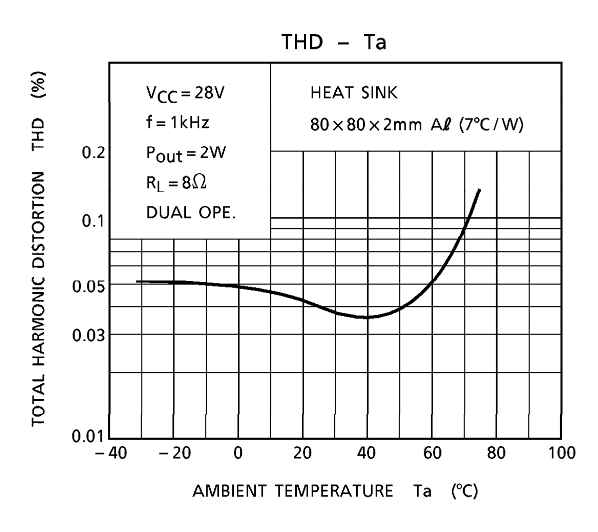

C.T. – f
VCC = 28V
f = 1kHz
Vout = 0.775Vrms (0dBm)
RL = 8Ω
Rg = 10kΩ
CROSS TALK C.T. (dB)
FREQUENCY f (Hz)

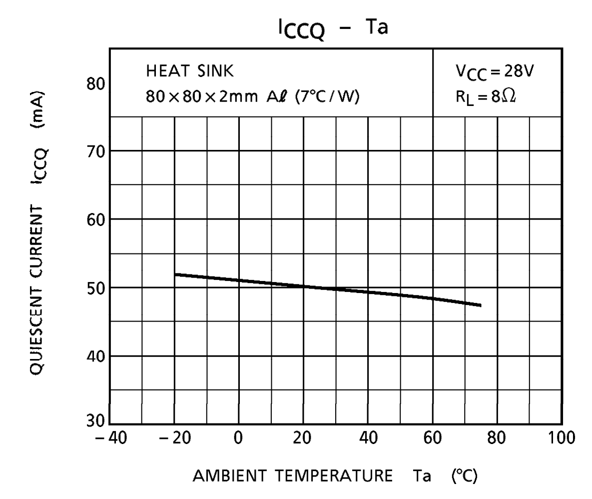

C.T. – Rg
VCC = 28V
f = 1kHz
RL = 8Ω
Vout = 0.775Vrms (0dBm)
CROSS TALK C.T. (dB)
SIGNAL SOURCE RESISTANCE Rg (Ω)

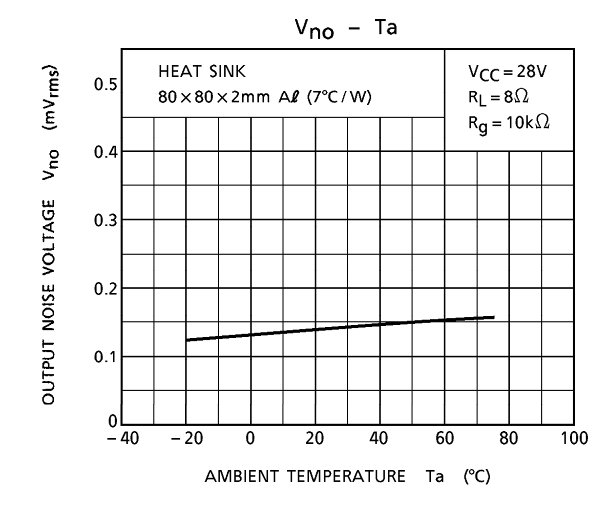

Vno – Rg
VCC = 28V
RL = 8Ω
OUTPUT NOISE VOLTAGE Vno (mVrms)
SIGNAL SOURCE RESISTANCE Rg (Ω)

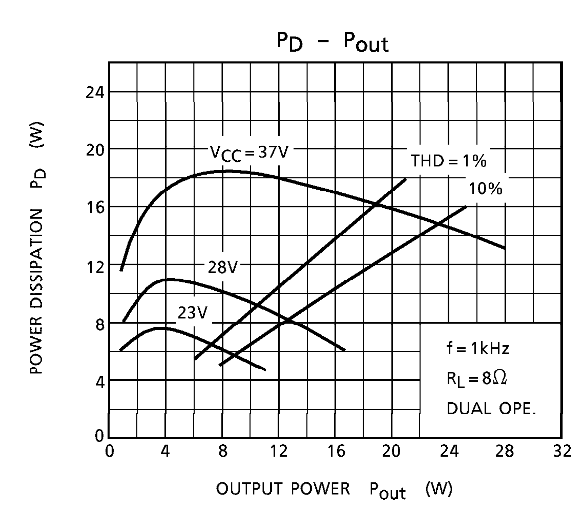

Pout – VCC
f = 1kHz
RL = 8Ω / 4Ω
THD = 10%
RL = 4Ω
8
OUTPUT POWER Pout (W)
SUPPLY VOLTAGE VCC (V)

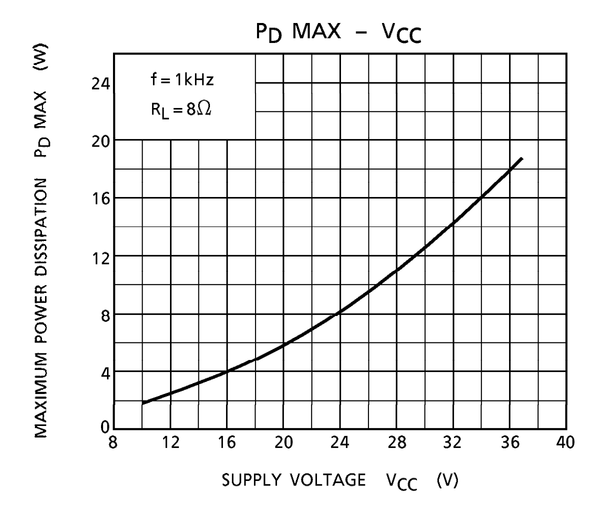

ICCQ, VOUT – VCC
Vin = 0
VOUT
ICCQ
QUIESCENT CURRENT ICCQ (mA)
OUTPUT DC VOLTAGE VOUT (V)
SUPPLY VOLTAGE VCC (V)

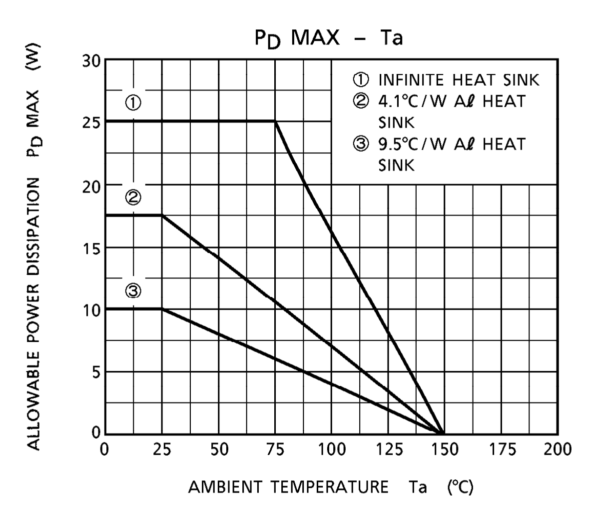

THD – Ta
VCC = 28V
f = 1kHz
Pout = 2W
RL = 8Ω
DUAL OPE.
HEAT SINK
80 × 80 × 2mm Aℓ (7°C / W)
TOTAL HARMONIC DISTORTION THD (%)
AMBIENT TEMPERATURE Ta (°C)


ICCQ – Ta
HEAT SINK
80×80×2mm Aℓ (7°C / W)
VCC = 28V
RL = 8Ω
QUIESCENT CURRENT ICCQ (mA)
AMBIENT TEMPERATURE Ta (°C)


Vno – Ta
HEAT SINK
80×80×2mm Aℓ (7°C / W)
VCC = 28V
RL = 8Ω
Rg = 10kΩ
OUTPUT NOISE VOLTAGE Vno (mVrms)
AMBIENT TEMPERATURE Ta (°C)

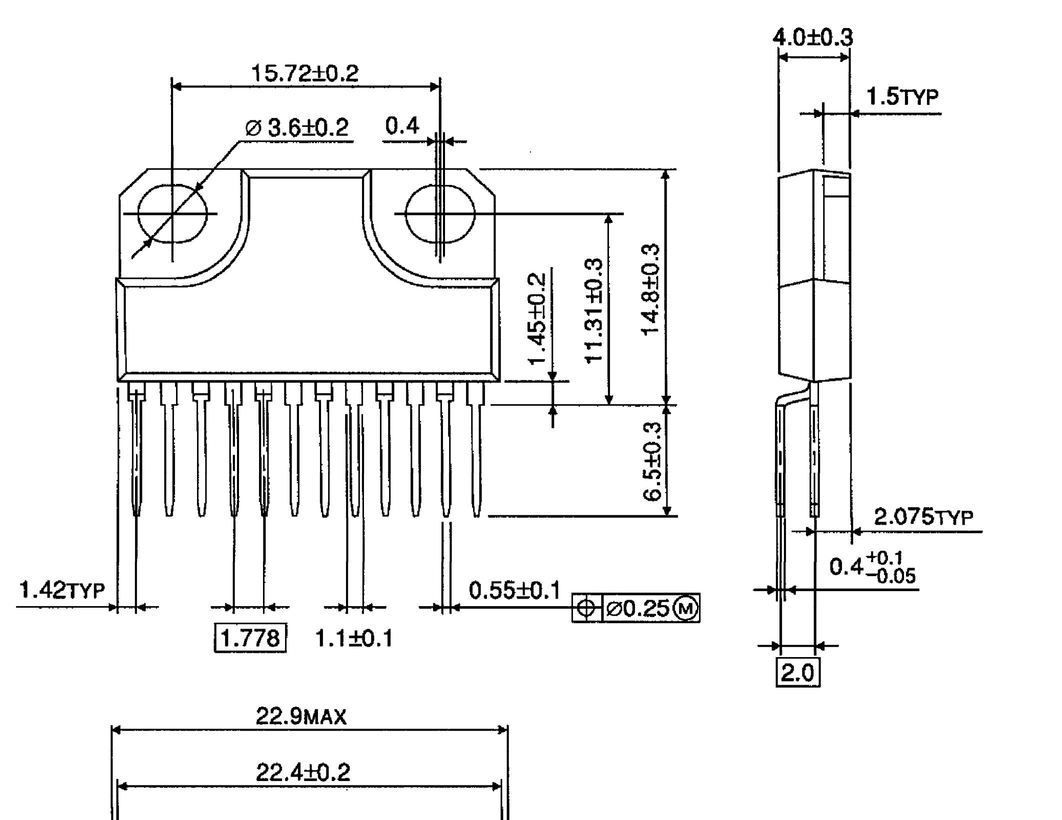

PD – Pout
VCC = 37V
28V
23V
THD = 1%
10%
f = 1kHz
RL = 8Ω
DUAL OPE.
POWER DISSIPATION PD (W)
OUTPUT POWER Pout (W)


PD MAX – VCC
f = 1kHz
RL = 8Ω
MAXIMUM POWER DISSIPATION PD MAX (W)
SUPPLY VOLTAGE VCC (V)


PD MAX – Ta
① INFINITE HEAT SINK
② 4.1°C / W Aℓ HEAT SINK
③ 9.5°C / W Aℓ HEAT SINK
ALLOWABLE POWER DISSIPATION PD MAX (W)
AMBIENT TEMPERATURE Ta (°C)

OUTLINE DRAWING
HZIP12-P-B

Unit : mm



Weight : 4.04g (Typ.)